



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/791,813	03/04/2004	Jung Hoon Seo	1630-0138P	3656

2292 7590 03/22/2007  
BIRCH STEWART KOLASCH & BIRCH  
PO BOX 747  
FALLS CHURCH, VA 22040-0747

EXAMINER
----------

MALDONADO, JULIO J

ART UNIT	PAPER NUMBER
----------	--------------

2823

SHORTENED STATUTORY PERIOD OF RESPONSE	NOTIFICATION DATE	DELIVERY MODE
3 MONTHS	03/22/2007	ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Notice of this Office communication was sent electronically on the above-indicated "Notification Date" and has a shortened statutory period for reply of 3 MONTHS from 03/22/2007.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

**Office Action Summary**

Application No.

10/791,813

Applicant(s)

SEO, JUNG HOON

Examiner

Julio J. Maldonado

Art Unit

2823

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 19 December 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) 1-4 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 5-8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 02/20/2007 has been entered.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 5-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hata et al. (U.S. 2002/0190263 A1, hereinafter Hata) in view of Matsumoto et al. (U.S. 2003/0082893 A1, hereinafter Matsumoto) and Miyamoto (US 5,246,888).

Hata (Fig.1) teaches a light emitting device including a sapphire substrate (1); a III-V n-semiconductor layer (4), an activated layer (5), and a III-V p-semiconductor layer (9), formed in order, on top of the sapphire substrate (1); a transparent electrode (10) directly formed on top of the p-semiconductor layer; a p-pad electrode (11) directly formed on the top of the transparent electrode (10); and an n-pad electrode (12) formed

Art Unit: 2823

on part of a mesa-cut section of the n-semiconductor layer (4) for extending an electric current (Hata, [0049] – [0056] and [0202]).

Hata fails to disclose plasma activating the p-semiconductor layer. However, Matsumoto (Fig.3) teaches a related light emitting device including a sapphire substrate (21); a III-V n-type semiconductor layer (22), an active layer (24, 25, 26), and a III-V p-type semiconductor layer (28) formed in order on top of the sapphire substrate (21), wherein the p-type semiconductor layer (28) is activated and wherein said activation step includes a plasma treatment (Matsumoto, [0018] – [0037]). Furthermore, Matsumoto teaches wherein said plasma treatment is an ashing process, i.e., an oxygen plasma treatment (Matsumoto, [0022]). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Hata and Matsumoto to enable a plasma activated p-type semiconductor layer in Hata according to the teachings of Matsumoto for the further advantage of removal of organic contaminants from the p-semiconductor (Matsumoto, [0033]).

Still the combination of Hata and Matsumoto fail to disclose wherein said oxygen plasma is at a temperature less than about 600°C. However, Miyamoto teaches a semiconductor device including a substrate treated with ashing (oxygen plasma) at temperature of 200°C (Miyamoto, column 3, lines 4 – 20). Further support of ashing at temperatures around 200°C can be found in Kubota et al. to U.S. 6,501,014 B1 (column 20, lines 9 – 13). It would have been within the scope of one of ordinary skill in the art to combine the teachings of Hata and Matsumoto to enable the oxygen treated layer Miyamoto et al because one of ordinary skill in the art at the time the invention was

Art Unit: 2823

made would have been motivated to look to alternative suitable ashed treated layers in Hata and Matsumoto and art recognized suitability for an intended purpose has been recognized to be motivation to combine. MPEP 2144.07.

Still the combination of Hata, Matsumoto, and Miyamoto fail to disclose therein the oxygen plasma treatment is performed at a temperature less than about 600°C. However, in the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. MPEP 2144.05. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the plasma treatment disclosed in the combined teachings of Hata, Matsumoto and Miyamoto to arrive at the claimed invention.

#### ***Response to Arguments***

4. Applicant's arguments filed 12/19/2006 have been fully considered but they are not persuasive.

Applicants argue, "...Hata et al. do not disclose plasma activating the p-semiconductor layer, and Miyamoto does not disclose the p-semiconductor layer is activated by a heat-treatment...Matsumoto et al. generate the oxide film on the surface of the p-type contact layer and then remove the oxide film with one of acid and alkali. However, the present invention activates the p-semiconductor layer and then directly forms a p-pad electrode without a removal process of an oxide film after the heat-treatment...". In response to this argument, the determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious

Art Unit: 2823

from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. See MPEP 2113.

**Conclusion**

5. Applicants are encouraged, where appropriate, to check Patent Application Information Retrieval (PAIR) (<http://portal.uspto.gov/external/portal/pair>) which provides applicants direct secure access to their own patent application status information, as well as to general patent information publicly available.

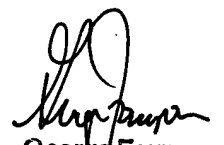
6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner Julio J. Maldonado whose telephone number is (571) 272-1864. The examiner can normally be reached on Monday through Friday.

7. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith, can be reached on (571) 272-1907. The fax number for this group is 571-273-8300. Updates can be found at <http://www.uspto.gov/web/info/2800.htm>.



Julio J. Maldonado  
March 14, 2007

Julio J. Maldonado  
Patent Examiner  
Art Unit 2823



George Fourson  
Primary Examiner